

Background

The use of text messaging, or short message service (SMS), as a platform for the dissemination of health interventions has grown rapidly in a few short years. Low cost, ubiquity, and potential for interactivity are features that have enabled increased interest in this channel of communication for a variety of campaigns, including sexual and reproductive health service awareness; risk reduction; health promotion; medication adherence; and management of chronic disease.

Pretesting, the process of assessing reactions to messages prior to finalizing materials, has been found to make health communication efforts more effective. Although certain texting interventions may have a variety of effects, one of the main goals of such interventions is to change health behavior. Health behavior is complex, often impacted by numerous factors including personality characteristics, environment, history, and other factors. When developers create text message-based interventions, it is important that they are taking some of these factors into account to create programs that have the greatest chance for success.

In health communication, conducting formative work that pretests the health messages one receives has been found to be a crucial component (Atkin & Freimuth, 2013). Pretesting messages, which involves getting feedback from the target audience about messages throughout the development process, is a principle of effective health communication campaign design (Noar, 2006).

Noting that health texting offers significant potential for addressing Department of Health and Human Services key priority areas, the Text4Health Task Force was convened in November, 2010. The Task Force issued seven recommendations and three guiding principles for developing health text messaging interventions, most notably to: "Conduct formative usability and user-centered research with the target audience at the beginning of the project and when major program changes occur. Content should be tailored to target populations and match relevant needs of the groups of interest (e.g., text messages should be culturally and linguistically appropriate)."

The purpose of this review is to examine current pretesting trends in the SMS intervention literature and provide recommendations on how to pretest messages prior to implementing a text message-based mobile health intervention.

Methods

To gather a sample of articles that covered SMS interventions, the authors developed a list of keywords informed from key reports and previous literature reviews on SMS-based interventions. We also systematically searched the reference lists of included studies. The following keywords were used in various combinations: cell phone, mobile phone, wireless, text message, text messaging, short message service, SMS, health, mHealth. Keyword phrases were used for searches in MEDLINE, Cochrane Library, Google Scholar, PsychINFO, PubMed, and ISI systems for years 1995 to 2012. A total of 274 articles met eligibility for inclusion and coding. Articles were then examined and coded to have 1) no mention of pretesting; 2) brief mention of pretesting, consisting of at least one sentence to less than one paragraph, or; 3) substantial information on pretesting, defined as one paragraph or more.

Results

- Out of 274 articles reviewed, seven articles met the inclusion criteria. The articles all discussed the use of focus groups as a pretesting method, however the amount of detail on the pretesting methods varied greatly by article (See Table 1). The articles varied on the topic of intervention, with three articles focused on sexual and reproductive health. Gold and colleagues study on the impact of sexual and reproductive health (SRH) and sun safety messages discussed the use of pretesting by describing the same as young males and females who were recruited from a university careers website. The description included a specific example of how messages were tested, starting with a scoring sheet on which participants rated various versions of the text messages to assess appeal, understanding, emotions and utility. Lim and colleagues also discussed focus groups, specifying their sample included a convenience sample 16-29 year olds in which they tested messages for understanding, relevance and amusement. Levine's article instead simply provided a brief mention of conducting four focus groups with youths to help with service development, but no other information on pretesting was specified. Two of the articles focused on HIV/AIDS prevention, with Uhrig and colleagues and Lewis and colleagues writing about the pretesting they did with the same sample—people living with HIV/AIDS. The messages were first created based on input of experts, but a final phase of focus groups with eight members of the target population were used to gather qualitative feedback on the messages. One study about smoking cessation (Free, et al) covered three methods of message development, discussing experts who provided feedback and briefly mentioning that messages were pretested in a series of focus groups in which each message was seen by at least two sets of focus group participants. Information was not presented on what messages were reviewed for specifically. One article (Patrick, et al) focused on weight loss, explaining that focus group participants not only provided message feedback, but viewed prototypes of the messages and responded to sample text and picture messages, which were part of the intervention.

- We identified three papers that focused on pretesting content for text messaging interventions. Woolford, et al conducted a series of four focus groups with obese adolescents to explore their perspectives on messaging content, inform editing texting content, with the goal of ultimately enhancing participation in a weight management program and boost program efficacy. The investigators convened small groups of four to eight adolescents to facilitate more in-depth exploration of their thoughts and preferences of the messaging. An audience response system was also used to elicit their feedback. Cornelius, et al, pretested HIV prevention messages among African American adolescents to assess the acceptability of such messaging among this target population. Interestingly, the investigators sought to evaluate the messaging content in its native form, distributing messages to cell phones among a panel of recipients for three weeks, then conducting a 90m debrief. Data gathered during the 3w messaging exposure, including responses and interactions via SMS, were evaluated. Reback, et al, employed a unique combination of methods, conducting three 90m initial focus groups with members of their PLWH target audience, followed by a two week beta testing phase among a small sample of near-peers, followed by extensive process evaluation and debriefs with participants.

Author and Year	Focus of Intervention	Method	Content Pretested with Target Audience	Sample
Lim, Hocking, Aitken, Fairley, Jordan et al., 2012	SRH	Focus group	*	16 to 29 year olds
Lewis, Uhrig, Bann, Harris, Furberg et al., 2012	HIV/AIDS	Focus groups	Yes	Health care providers, three experts in HIV prevention interventions, and eight men having sex with men
Uhrig, Lewis, Bann, Harris, Furberg et al., 2012	HIV/AIDS	Focus groups	Yes	Health care providers, three experts in HIV prevention interventions, and eight men having sex with men
Gold, Aitken, Dixon, Lim, Gouillou et al., 2011	SRH + sun safety	Focus groups	Yes	Four focus groups with young males and females recruited from the Monash University Careers website
Free, Whittaker, Knight, Abramsky, Rodgers et al., 2009	Smoking cessation	Focus groups	*	16 to 29 year olds Youth smoking cessation counselors, cognitive behavioral therapists, and "potential participants"
Patrick, Raab, Adams, Dillon, Zabinski et al., 2009	Weight loss	Focus groups	Yes	Overweight men and women
Levine, McCright, Dobkin, Woodruff & Klausner, 2008	SRH	Focus groups	Yes	Four focus groups with youth

Recommendations

- Use existing messages and evidence –based content**
- If targeting a different audience or using a different mode, pretesting is crucial
- Ideally, pretesting would be done with ALL messages
- Methods for pretesting may vary based on target population, goals, etc., but a strong pretesting design would take a hybrid approach—using aspects of focus groups but also gathering individual feedback**
- Ask participants to rate messages (1-5, where 1 is strongly disagree and 5 is strongly agree) on a variety of message characteristics including liking, comprehension, cultural relevance, and perceived persuasiveness
 - Next, calculate score for each message in a matrix. Scoring allows for messages to be assessed across multiple domains and facilitates identification of messages that may be less effective
- Use **focus group** to gather specific information on low scoring messages so messages can be improved
- Revise messages based on target population feedback and test messages again (if resources allow)

Conclusions

Pretesting is an important part of the health communication process. However, it is underreported in SMS interventions. More work needs to be done on the pretesting of messages so programs have the greatest chance of success.